

(12) 按照专利合作条约所公布的国际申请

(19) 世界知识产权组织
国际局



(43) 国际公布日:

2004年10月28日(28.10.2004)

PCT

(10) 国际公布号:

WO 2004/092272 A1

(51) 国际分类号: C08L 77/00, C08G 69/02
(21) 国际申请号: PCT/CN2004/000373
(22) 国际申请日: 2004年4月19日(19.04.2004)
(25) 申请语言: 中文
(26) 公布语言: 中文
(30) 优先权: 03116479.X 2003年4月18日(18.04.2003) CN

(71) 申请人(除美国以外的所有指定国): 上海杰事杰新材料股份有限公司(SHANGHAI GENIUS ADVANCED MATERIAL CO., LTD.) [CN/CN]; 中国上海市闵行区北松路800号, Shanghai 201109 (CN).

(72) 发明人: 及

(75) 发明人/申请人(仅对美国): 杨桂生(YANG, Guisheng) [CN/CN]; 解廷秀(XIE, Tingxiu) [CN/CN]; 中国上海市闵行区北松路800号, Shanghai 201109 (CN).

(74) 代理人: 上海专利商标事务所(SHANGHAI PATENT & TRADEMARK LAW OFFICE); 中国上海市桂平路435号, Shanghai 200233 (CN).

(81) 指定国(除另有指明, 要求每一种可提供的国家保护): AE, AC, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

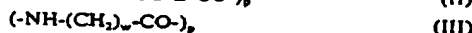
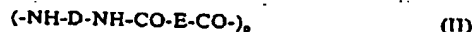
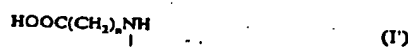
(84) 指定国(除另有指明, 要求每一种可提供的地区保护): ARIPO(BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), 欧亚专利(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), 欧洲专利(AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

本国际公布:
— 包括国际检索报告。

所引用双字母代码和其它缩写符号, 请参考刊登在每期PCT公报期刊起始的“代码及缩写符号简要说明”。

(54) Title: TOUGHENED NYLON, THE PROCESS OF PREPARING IT AND ITS USE

(54) 发明名称: 增韧尼龙、其制备方法及其用途



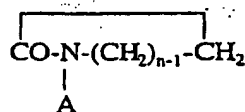
(57) Abstract: The present invention discloses a toughened nylon comprising base nylon and long-chain nylon, wherein the base nylon is formed by homopolymerizing or copolymerizing cyclic lactam monomers or its corresponding aminoacids in the presence of the long-chain nylon, and said cyclic lactams have a structure represented by formula (I) and its corresponding aminoacids have a structure represented by formula (I'), where in the formula (I) and (I'), A is H or an alkyl having 1-8 carbon atoms, $3 \leq n \leq 11$; wherein the long-chain nylon is selected from those nylons which have recurring units of formula (II), (III) or (IV), where in the formula (II), D represents $\text{-(CH}_2\text{)}_x$, optionally substituted by C_1 -alkyl; E represents $\text{-(CH}_2\text{)}_y$ or phenylene, both optionally substituted by C_1 -alkyl, and $4 \leq x \leq 34$, $4 \leq y \leq 34$; where in the formula (III), $7 \leq w \leq 34$, and in the formula (IV), $5 \leq u \leq 34$, $5 \leq v \leq 34$, and $u \neq v$; and wherein the amount of long-chain nylon used accounts for 2 to 45 weight percent of total weight of the toughened nylon, and the toughened nylon has a good interfacial bonding and has only one melting peak measured by differential scanning calorimetry analysis. Also discloses the process of preparing it and its use

[见续页]

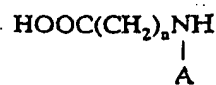
WO 2004/092272 A1

(57) 摘要

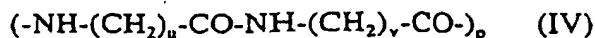
公开了一种增韧尼龙，它包括基体尼龙和长链尼龙，所述基体尼龙由环状内酰胺单体或其相应的氨基酸均聚或共聚而成，所述环状内酰胺具有式(I)所示结构，其相应的氨基酸具有式(I')所示结构，式(I)和式(I')中，A 是 H 或者具有 1-8 个碳原子的烷基， $3 \leq n \leq 11$ ；所述长链尼龙是选自具有式(II)、(III)或(IV)所示重复单元的尼龙，式(II)中，D 表示 $-(CH_2)_x-$ ，其中的 H 可任选地被 C_{1-4} 烷基取代；E 表示 $-(CH_2)_y-$ 或者亚苯基，其中的 H 可任选地被 C_{1-4} 烷基取代， $4 \leq x \leq 34$ ， $4 \leq y \leq 34$ ，式(III)中， $7 \leq w \leq 34$ ，式(IV)中， $5 \leq u \leq 34$ ， $5 \leq v \leq 34$ ，且 $u \neq v$ ，所述长链尼龙的用量占增韧尼龙总重量的 2-45%，该增韧尼龙有良好的界面结合，用差示扫描量热法测得只有一个熔融峰。还公开了该增韧尼龙的制备方法及其用途。



(I)



(I')



10/553019
JC05 Rec'd PCT/PTO 11 OCT 2005

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2004/000373

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 C08L77/00, C08G69/02
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

IPC C08G69, C08L77,

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP5 - 345856 A (TOYOBO KK) 27. December 1993(27. 12. 1993)	1-10
A	US5242733 A (E. I. DU PONT DE NEMOURS & Company) 07. September 1993 (07. 09. 1993)	1-10
A	JP11 - 080542 A (EMS-INVENTA AG) 26. March 1999(26. 03. 1999)	1-10
A	JP7 - 324226 A (ASAHI KASEI KOGYO KK) 12. December 1995(12. 12. 1995)	1-10

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

11 - AUG 2004 (11 - 08 - 2004)

Date of mailing of the international search report

19 - Aug 2004 (19 - 08 - 2004)

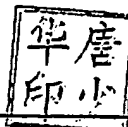
Name and mailing address of the ISA/CN

6 Xitucheng Rd., Jimen Bridge, Haidian District,
100088 Beijing, China
Facsimile No. 86-10-62019451

Authorized officer

Tang Shaohua

Telephone No. 86-10-62085637



INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2004/000373

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 C08L77/00, C08G69/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

IPC C08G69, C08L77.

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP5 - 345856 A (TOYOKO KK) 27. December 1993(27. 12. 1993)	1-10
A	US5242733 A (E. I. DU PONT DE NEMOURS & Company) 07. September 1993 (07. 09. 1993)	1-10
A	JP11 - 080542 A (EMS-INVENTA AG) 26. March 1999(26. 03. 1999)	1-10
A	JP7 - 324226 A (ASAHI KASEI KOGYO KK) 12. December 1995(12. 12. 1995)	1-10

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>		<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>
--	--	---

Date of the actual completion of the international search
11 - AUG 2004 (11 - 08 - 2004)

Date of mailing of the international search report
19 - Aug 2004 (19 - 08 - 2004)

Name and mailing address of the ISA/CN
6 Xitucheng Rd., Jimen Bridge, Haidian District,
100088 Beijing, China
Facsimile No. 86-10-62019451

Authorized officer:

Tang Shaohua

Telephone No. 86-10-62085637



国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2004/000373

检索报告中引用的 专利文件	公布日期	同族专利	公布日期
JP5 - 345856 A	27. 12. 1993	无	
US5242733 A	07. 09. 1993	CA2048352 A	09.02.1992
		EP0470614 A	12.02.1992
		AU8169891 A	13.02.1992
		US5155178 A	13.10.1992
		JP6279674 A	04.10.1994
		DE69106622 E	23.02.1995
JP11 - 080542 A	26. 03. 1999	EP0885930 A1	23.12.1998
		DE19725617 A1	24.12.1998
		US2002128377 A1	12.09.2002
JP7 - 324226 A	12. 12. 1995	无	